Employment Protection and Migration

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Abstract

We argue in this paper that labor market institutions, and more particularly employment protection (EPL), are an important determinant of migration. Using a bilateral migration database, we empirically show that the employment protection *differential* has a negative impact on bilateral flows. Contrary to popular wisdom which assumes that migrants look for a more protected market, we show that migrants tend to move to countries where employment protection is close to that of their country of origin. Relative preferences over wages or employment, or a distinct impact on wages and employment may explain such results. We also show that these effects are stronger for high-skilled workers.

Key words:
Migration, employment protection, labor markets
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1. Introduction

"Immigrants are taking advantage of the system". This belief is increasingly shared in various developed countries. It is largely relayed by populist politicians, who use popular fears in a context of rising unemployment and large social protection deficit. If economists widely recognize the economic benefits of migration in developed countries, the fear of an unsustainable burden coming from large migration flows is strong. According to the World Value Survey (2009), in the US, 55.4% of people consider that *"employers should give priority to American people over immigrants in the attribution of jobs "*. For Germans, the British and Japanese, the rate is respectively 55.7%, 62.9% and 62.7%. In this context, the attention has largely been focused on welfare benefits, social protection and job security.

Concerning employment protection, popular wisdom sees migration as a threat for job security. "*Migrants damage job security*", the British newspaper *The Telegraph* announced in 2007.[1] Some workers fear that migrants are simply "stealing" their jobs. Hence in the context of an economic crisis, the jobs attributed to immigrants are considered as substituting to native employment rather than as being complementary. Despite the lack of economic foundations for such an argument, extreme-right political parties use this very simple argument: *"one immigrant means one unemployed native worker"*. Another argument is that immigration may affect the quality of jobs. Employment protection may also be attractive for migrants who are looking for protective legislation. However , the effect of job protection is not straightforward. Immigrants are indeed more likely to be "outsiders" in the labor market of their destination country. And if the effects of employment protection on the level of aggregate employment are ambiguous, its effects on the dynamic of job destruction and creation are widely accepted. If employment protection slows down the transition between unemployment and employment, it may also reduce the capacity of migrants to get a job. In other words, it is not proven that migrants look for more protective employment legislation. This paper thus addresses the following question empirically : how does employment protection in source and destination countries affect bilateral migration?

The economic literature largely explores the linkages between labor markets and migration. Since Hicks (1932), the wage differential between the source and destination country has been seen as a fundamental determinant of migration. Several authors have focused more recently on the influence of *immigration* on local labor markets. For instance , Borjas (1999) showed theoretically that immigration should increase the national income and that the greater the differences in productive endowments between immigrants and natives, the higher the gains. Empirically, a large number of studies have tried to estimate the

[1] 19 Nov. 2007, http://www.telegraph.co.uk/news/uknews/1569800/Migrants-damage-job-security-says-economist.html

influence of immigration on wages using spatial correlation approaches (Borjas, 1983; Grossman, 1982; Borjas et al., 1997; Schoeni, 1997). Other authors have tried to measure this effect through natural experiments such as in the influential paper by Card (1990) which measured the impact of "Mariel" immigration flows from Cuba to Miami in September 1980. However, there is still no consensus on the real effects of immigration. This literature also focuses on the social implications of migration , but does not deal with the issue of the influence of the social environment on migration. The latter effect has been explored by the *welfare migration* literature (see Brueckner (2000) for an overview or De Giorgi and Pellizzari (2009) for an analysis on welfare migration in Europe). Nevertheless, this literature mainly focuses on the influence of social expenditures and not on labor market institutions as such. Razin et al. (2009) for instance show that welfare state benefits have an adverse effect on the migrants' skill composition. Concerning the effect of labor market institutions, Geis et al. (2008) found in a microeconomic study that employment protection, union coverage and unemployment benefits have a positive effect on migration. This study is, to the best of our knowledge, the only one estimating the specific effect of EPL on migration. However, there are several limitations that we try to take into account in our empirical strategy. First, the study neglects the influence of labor market conditions in the country of origin. We argue that the employment protection *differential* between the country of origin and of destination may be an important factor of migration (and not only EPL in the destination country). Second, authors use micro data which allow them to include individual characteristics of migrants , but limit the destination choice to four receiving countries. In our study, the geographical coverage has been extended to all OECD countries. Third, their institutional variables may be correlated with other country characteristics. For instance, their results may be driven by the correlation between employment protection and migration policy. In our analysis, we exploit the bilateral dimension of the database, allowing us to include destination country fixed effects in order to control for unobserved country characteristics.

Our analysis makes a number of contributions to the literature. To the best of our knowledge, it is the first analysis of the effects of employment protection on migration using bilateral migration data. This allows us to consider the influence of employment protection in the country of destination *and* of origin. We show that the employment protection *differential* is an important determinant of migration.

We find that the differential of employment protection between source and destination country has a strong, significant and negative impact on migration , which contradicts the result of Geis et al. (2008). Contrary to popular wisdom which assumes that migrants are looking for more protected markets, we show that migrants tend to move to countries where employment protection is close to that of their country of origin. This result, based on migration flows data (OECD, 2010), is valid taking into account (1) the high occurrence of zero or missing flows using Pseudo-Poisson Maximum Likelihood estimators and (2) a

possible endogeneity bias using IV estimators. Relative preferences over wages or employment, or a distinct impact on wages and employment may explain these results. Then, by using a database on migration stock (Docquier and Marfouk, 2004), we are also able to distinguish migration by skill level. We show that the effects described above are stronger for high-skilled workers.

The paper is organized as follows. Section 2 defines employment protection, presents its measurement and provides a brief overview of its implementation in the world. Section 3 presents the data used and the econometric issues. Section 4 presents the results for the determinants of migration *flows* and their *selection* by educational level. Section 5 concludes.

2. Employment Protection in the World and its Economic Effects

2.1. Employment Protection: Measurement and Implementation in the World

Employment protection may be defined as follows : "*Any set of regulations, either legislated or written in labor contracts that limit the employer's ability to dismiss the workers without delay or cost*" (Pissarides, 2001). The OECD (1999) lists five types of employment protection: (1) administrative procedures, (2) notice of termination , (3) severance payment, (4) difficulty of dismissal, and (5) additional measures for collective dismissals.

Botero et al. (2004) propose a broader definition including (i) alternative employment contracts, (ii) the cost of increasing hours worked, (iii) the cost of firing workers, and (iv) dismissal procedures. They propose four subindexes that are aggregated to get a consistent estimate of the strictness of employment laws in 85 countries, including a significant proportion of developing countries. Their index reflects *"the incremental cost to the employer of deviating from a hypothetical rigid contract, in which the conditions of a job are specified and a worker cannot be fired"*. We will use it to capture the effect of employment protection empirically. This index is included between 0 and 1. The higher the index is, the stronger the employment protection.

The four subindexes used to build this aggregate index are the following. The first one captures the strictness of the protection against alternative employment contracts, such as part-time labor or temporary contracts. The second index measures the cost of increasing working hours from 1,758 hours (the level in Denmark before overtime) per year initially to 2,418 hours per year (Kenya's legal maximum per year before overtime). The third subindex captures the cost of firing workers. It is based on a scenario where a firm with 250 employees wants to fire 50 of them (25 for redundancy and 25 without cause). The cost of firing includes paying the sum of the notice period, the severance payment and any other mandatory penalty. The fourth subindex is the "*restrictions on employers for firing workers*". It includes notifications, approvals, mandatory relocation or restraining and priority rules for reemployment.

Measuring employment protection is a difficult task (see Bertola et al. (2000) for an overview of the main methodological challenges). Two main other fami-

lies of indexes could have been chosen to approximate the level of employment protection: the Doing Business indexes built by the World Bank or the OECD EPL indexes. The latter have a temporal dimension and take into account 18 dimensions related to employment protection. Unfortunately, these indexes are only available for OECD countries. Therefore, using them is not relevant for our study which focuses on global migration trends and not only on migration between OECD countries. The former are available for a larger number of countries, but the scope of the indexes is narrow. Two indexes are specifically related to employment protection, as defined by Pissarides (2001): the difficulty of hiring index and the difficulty of firing index. The former focuses only on part-time and fixed-term contracts. On the contrary, the latter includes information related to the employment insurance, which is outside the scope of our study. The goal of Doing Business indexes is to capture a general level of "*rigidity of employment*", which is not exactly the same thing as employment protection, *per se*. For all these reasons, we use the index proposed by Botero et al. (2004).[2]

Graph 1 shows the relation between the level of employment protection, proxied by the aggregated index built by Botero et al. (2004) for the year 2000, and the GDP per capita. It shows a strong heterogeneity of employment protection laws and a low correlation with the income level. The level of employment protection can be very high in very poor countries such as Mozambique (0.79) or Tanzania (0.69) , but also in rich countries (0.74 in France, Spain or Sweden). The highest levels are observed in Russia (0.82) and Tunisia (0.81). On the contrary, the lowest levels are observed in Zambia (0.14) and New Zealand (0.12). Table 1 shows the average level by region and income level. The average level of EPL is almost identical in high income OECD countries and low income countries. Europe and Central Asia are the regions with the highest level of employment protection , while North America and Asia are the regions with the lowest level. If the correlation with income is low, the legal tradition (civil or common law) is a strong determinant of employment protection (Botero et al., 2004). Globally, it is shown that civil law countries and countries with a socialist tradition have a stronger level of employment protection, all other things being equal. In a very recent paper, Campos and Nugent (2012) show that unemployment and trade liberalization appear to be the main determinants of *changes* in employment protection legislation.

[FIGURE 1 ABOUT HERE]

[TABLE 1 ABOUT HERE]

[2]This index has been very recently extended by Campos and Nugent (2012) for the 1960-2005 period. But as noted by these authors, their index (LAMRIG) has been *"designed to be as consistent as possible with the cross-country comparisons"* of Botero et al. (2004). As we use migration data for 2000, the use of the Botero et al. (2004) index is completely suitable for our study.

The International Labour Organization took several initiatives relative to the reinforcement of workers' protection. In 1950, the International Labour Conference adopted a resolution denouncing the lack of international regulation concerning labor contracts. In 1963, a first recommendation was adopted on the termination of employment. But it was only in 1982 that a convention was formally adopted (The Termination of Employment Convention, 1982, No. 1958). This convention sets as a fundamental principle the need for a valid reason connected with the: (a) capacity or (b) conduct of the worker; or (c) the operational requirements of the undertaking. It forbids certain reasons such as union membership or maternity leave. Workers must have the right to question the justification given if they think that the termination of employment is unjustified. The convention also requires a reasonable period of notice or compensation. If these rules can be seen as the basis of universal principles regarding employment protection, only 36 countries have ratified this convention. The ILO general survey on the protection against unjustified dismissal (ILO, 1995) documents the heterogeneity of employment protection regulations in different countries. Most countries have specific legislative tools. These rules are included either in the labor code, the labor law, the civil law or in specific legislation related to employment. The constitution of some countries such as Brazil also includes such principles. In most countries, collective agreements complement the legislation. But in some others such as Zambia, employment protection is solely dealt with in collective agreements. Legislation on fixed-term contracts is also very diverse. Most countries limit the term of such contracts. Mali for instance forbids fixed-term contracts exceeding two years. These contracts cannot be renewed more than twice. Even in countries where there is no limitation on the use of fixed-term contracts, specific rules concerning the termination of such employment do exist. In average and to a certain degree, almost all countries do have formal rules connected with employment protection. ILO (1995), Betcherman et al. (2001) or ILO (2011) present numerous examples of specific regulations in various countries, including a large proportion of developing countries.

One specific concern in developing countries is the effective coverage of such regulations when the level of informality is high. In an economy where most individuals are working in informal companies, legal regulations related to employment protection are not really respected. However, many countries take this situation into account and have adapted their legislation to recognize these informal or even "implicit" labor contracts. In countries such as Mali for instance, if the labor contract is not written, it is supposed to be a permanent work contract. This implies that a "valid reason" should be given to the worker in case of a termination of employment. If it is not the case, the worker can go to court, even if there is no written or formal contract. The effectiveness of such provisions therefore depends on the efficiency of the legal system.

Another dimension is the correlation between employment protection and informality. A huge literature, starting with Todaro (1969) and Harris and Todaro (1970), and more recently the insider/outsider theories (Lindbeck and

Snower, 2001), has shown that regulations which are too tight in the formal sector may explain the shift of workers from the formal sector to the informal sector. Besley and Burgess (2004) also showed that "pro-worker regulations" in India explained a shift from the formal to the informal sector. It was also the view of the World Bank in 1990 when it stated in the World Development Report that *"labour market policies raise the cost of labour in the formal sector and reduce labour demand, increase the supply of labour to the rural and urban informal sectors."* (World Bank 1990 quoted by Freeman 2010). Other papers challenge such a relation empirically (see Freeman 2010 for an overview). But one can expect a positive correlation between employment protection and informality. What are the implications of such a correlation? They are twofold. First, we should control for the level of informality in our empirical strategy. Second, we have to keep in mind that a possible channel of transmission from employment protection to migration may be this link through the level of informality. We will take these two implications into account.

2.2. The Economic Effects of Employment Protection and the Transmission Channel with Migration

Employment protection is likely to have a significant effect on (1) the level of wages, and (2) the level of employment, unemployment and informality. Both dimensions influence the decision to migrate. By including the effects on wages and employment, explaining the influence of employment protection on migration is relatively straightforward. By using a traditional model of migration, such as the one of Grogger and Hanson (2011)[3], we can identify several theoretical channels that may explain our empirical results. This model is based on the maximization of a linear utility function. For each period, individuals will compare their utility in their home country and their utility in every possible country of destination if they decide to migrate, taking the cost of migration into account. Their utility will be a function of three parameters: their wage, their probability of being unemployed, and the cost of migration if they decide to migrate. By maximizing their utility, individuals will decide to migrate or not, and will also decide on the destination. This type of model can explain the *scale* of migration empirically, but also the *selection* of migrants based on their skill level, as shown by Grogger and Hanson (2011).

2.2.1. The Effect of Employment Protection on Wages

There is no consensus in the literature regarding the final effect of employment protection on wages. Lazear (1990) predicts that firing costs drive wages down in a competitive economy with decentralized wage-setting. In this model, the worker transfers the amount of the severance pay to the firm on signing the contract[4]. Pissarides (2001) also suggests a negative effect of employment protection on wages. In his framework, workers are risk-averse and accept a lower

[3] Which is itself derived from the seminal model of Roy (1951).

[4] However, in the empirical part of this paper, he shows that employment protection reduces employment because of wage rigidities.

income during productive periods in order to receive a higher income during unproductive times.

Another field of the literature is based on the insider/outsider theories[5]. Saint-Paul (2002) considers that incumbent workers get a rent due to the existence of match-specific human capital. The rent thus grows with the gap between the productivity of insiders and outsiders, but also with their bargaining power. Bertola (1990) considers that the final effect of employment protection will depend on the wage-setting institutions. When trade unions only care about their working members, employment protection increases the total labor income for insiders. These workers benefit from additional bargaining power in the wage process. In an efficiency wage framework, Guell (2000) shows that severance payments increase the wages of insiders in equilibrium. Garibaldi and Violante (2005) argue that workers face a trade-off between their wish for a higher wage (the income effect) and the probability of getting fired (the job security effect). Under certain restrictive conditions, if the wage-setting institution is a monopolistic union and the elasticity of the firm's firing probability to wages is low enough, workers will demand higher wages when employment protection rises. Other authors consider that enhanced employment protection will increase the incentives for firms to invest in firm-specific human capital (Arulampalam et al., 2004). Nickell and Layard (1999) show that these investments may pay off in terms of higher productivity and higher wages.

It is difficult to conclude, both from a theoretical and empirical[6] perspective on the final effect of employment protection on wages. It will mainly depend on the wage-setting institutions and the rigidity of nominal wages. If we adapt the specification adopted in the Grogger and Hanson (2011) model, the wage in country h for skill level j can be defined as follows:

$$w_h^j = wo_h + \lambda_h^j P_h + \delta_h^j D_s^j \tag{1}$$

where wo_h is the wage for an unskilled and unprotected worker in country h (without the wage effect of employment protection), P_h is the level of employment protection and λ_h^j is the wage effect of such a protection for a worker with skill j in destination countries. δ_h^j is the *wage premium*, i.e. the absolute wage difference between high-skilled workers and unskilled workers[7]. $D_s^j = 1$

[5] See Lindbeck and Snower (2001) for an overview.

[6] An establishment-level study (Blanchflower et al., 1990) and a cross-country study (Holmlund and Zetterberg, 1991) suggest insider wage gains. Using a Dutch data set of individuals of all tenures and backgrounds, van der Wiel (2010) also finds a strong positive effect of employment protection on wages. Leonardi and Pica (2007) find the opposite effect using Italian micro-data.

[7] We should notice here that δ is not the return to education *per se* , but an absolute difference between a skilled worker's wages and an unskilled worker's wages. We do not focus here on relative differences of wages and utilities. Grogger and Hanson (2011) show that migration stocks are driven by absolute wage differences, not relative wage differences. We will then use a linear utility function instead of a log-linear utility function as in Borjas (1987) for instance. Concerning wages, Grogger and Hanson (2011) use a log-linear definition of

stands for workers with skill j, 0 otherwise[8]. It means that λ_h^j can be negative if employment protection has a negative effect (as in Lazear, 1990 or Pissarides , 2001) or positive if employment protection increases the bargaining power of workers and thus their wages (Saint-Paul, 2002; Bertola, 1990; Guell, 2000).

The wage effect of employment protection may also vary based on the skill level ($\lambda_h^1 \neq \lambda_h^2$). This assumption follows empirical results in the literature showing that the effects are not similar for high-skilled and low-skilled workers. van der Wiel (2010) finds that an additional month of notice increases the wages of low-skilled workers by 5.75% against only 2.77% for high-skilled workers. Similarly, Leonardi and Pica (2007) finds that the introduction of a severance payment for small firms in Italy explained a decrease of the returns to tenure.

2.2.2. The Effect of Employment Protection on Employment

Two distinct effects can be identified. Employment protection may have an effect on (1) the aggregate level of employment, but also on (2) the job finding probability. Concerning the former, there is also a lack of consensus. Bentolila and Bertola (1990) find a positive impact on long-run average employment. If firms are much more reluctant to hire due to higher costs, hired workers also quit much more rarely , leading to a possible positive effect. In a dynamic set-up, they show that employment protection may reduce labor demand in good times due to a higher marginal revenue product needed to start hiring, and may increase it in bad times. Lazear (1990) shows that the effect of employment protection may be neutral if wages can be adjusted in order to take the additional cost for the firms into account. The cost is thus born by workers. Nevertheless, we may observe a decline in employment if wages increase due to an improved bargaining power for workers (Bentolila and Dolado, 1994)[9]. On the contrary, employment may increase if employment protection increases the level of productivity through better cooperation between workers (Fella, 2004) or through more training (Belot et al., 2002). The final effects on employment will then depend on (1) the effect of employment protection on wages, and (2) the effect on productivity. Empirical results are also not clear-cut. Blanchard and Portugal (2001) show that the rates of job creation and destruction are lower in Portugal than in the US due to a higher level of employment protection. Gomez-Salvador et al. (2004) find a significant lower job creation rate and a non-significant effect on job destruction.

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wages which allows them to introduce the return to education directly. However, they only use this return to education when they estimate log-linear utility function models. When they estimate their utility function model, they only focus on absolute wage differences between skilled and unskilled workers. By defining as such the wage of skilled and unskilled workers, we make the same choice here. Following our linear utility model, we will then only need absolute wage differences.

[8]For simplification purposes, we assume there is no skill deprivation between source and destination country, so that $D_s^j = D_h^j = D^j$.

[9]It is also what Lazear (1990) finds empirically.

The effect on the *job finding probability* is more likely to be negative. For instance, if Bentolila and Bertola (1990) show that higher firing costs may increase long-run average employment, they also consider that it leads to a fall in the attrition rate due the reluctance of firms to hire new workers. The job finding probability for outsiders should be negative in this case. Vindigni (2008) also considers that employment protection may reduce job creation, depressing the exit rate from unemployment to the detriment of the unemployed. As migrants are mainly newcomers on the labor market and therefore *outsiders*, the effect of employment protection on their probability of finding a job is therefore most likely negative, even if the net effect of employment protection on aggregate employment is unclear. In the Grogger and Hanson (2011) model, it is possible to include this probability of finding a job in the utility function of the migrant. As in Harris and Todaro (1970), what matters for the migrant is the *expected* wage, i.e. the wage weighted by the probability of finding a job. If employment protection has an impact on this probability, it also has an impact on the utility of the migrant.

In developing countries, unemployment insurance is very weak. The official unemployment rate may be very low despite a very high level of *underemployment*. Most of what the ILO calls "vulnerable employment", including contributing family workers and self-employment, is indeed a form of underemployment. It means that the "job finding probability" must be understood in developing countries as a probability of finding a "formal job", more than a probability of being employed.

If the literature has largely reviewed the effects of employment protection in developed countries, few studies have focused specifically on developing countries. We can quote the study of Heckman and Pages-Serra (2000) that shows that job security provisions and costs of dismissals are high in Latin America, and much costlier than in OECD countries. But as shown by Freeman (2010), the empirical evidence from different countries is mixed. Kugler (2004) find that the weakening of EPL in Colombia was associated with an employment increase and a decline in job tenure in the formal sector relative to the informal sector. Studies on Chile (Edwards and Edwards, 2000; Montenegro and Pages, 2004; Petrin and Sivadasan, 2006) find no effects on aggregate employment. In India, Besley and Burgess (2004) show that changes in regulations towards more employment protection lead to a shift in employment and output from the formal to the informal sector.[10]

2.2.3. The Effect of Employment Protection on Migration

The final effect of employment protection on migration will therefore depend on three parameters: (1) the effect on employment, (2) the effect on wages and

[10]Bhattacharjea (2006) criticizes the index of "pro-worker regulations" built by Besley and Burgess (2004). However, Ahsan and Pages (2009) report that the results are robust to Bhattacharjea's amended measure.

(3) the relative preference for employment and wages. As there is no consensus in the theoretical literature on the effect of employment protection on these parameters, it is mainly an empirical issue. We will therefore adapt the utility function proposed by Grogger and Hanson (2011) in order to include the potential effect of employment protection.

The utility of migrating from source country s to destination country h is a linear function of the difference between wage w_h^j on the one hand and, migration cost C_{sh}^j and probability of being unemployed $Prob(u)_h$ on the other hand, as well as an unobserved idiosyncratic term ϵ_{sh}. We also control for the unobserved characteristics of country h that may affect the utility of the migrant by introducing A_h[11] into the utility function. The utility function is therefore given by the following equation:

$$U_{sh}^j = \alpha w_h^j - \beta C_{sh}^j - \chi Prob(u)_h + A_h + \epsilon_{sh} \tag{2}$$

Considering that employment protection may have an impact on the probability of being unemployed, we can rewrite $Prob(u)_h = \delta + \gamma^j.P_h$ with $\delta \in [0,1]$ an exogenous rate of unemployment and γ^j the influence of employment protection on the level of unemployment. The utility function will therefore be equal to:

$$U_{sh}^j = \alpha w_h^j - \beta C_{sh}^j - \chi\delta - \chi\gamma^j.P_h + A_h + \epsilon_{sh} \tag{3}$$

If labor markets are fully flexible and the effect on wages is strictly the opposite of the effect on employment, the net effect of employment protection on the level of utility will only depend on parameters α and χ. If $\chi > \alpha$, job security is considered more important than the wage effect. It may be interpreted in some ways as a parameter of risk aversion.

We assume that workers choose whether or not to migrate so as to maximize their utility. We also assume that ϵ_{sh} follows an i.i.d. extreme value distribution. Following Grogger and Hanson (2011), we can apply the result of McFadden (1974) to write the log odds of migration to destination country versus staying in the source country as[12] :

$$\ln \frac{N_{sh}^j}{N_{ss}^j} = \alpha[(wo_h - wo_s) + (\delta_h^j - \delta_s^j)] - \beta C_{sh}^j + (\alpha\lambda^j - \chi\gamma^j)(P_h - P_s) + (A_h - A_s) \tag{5}$$

[11] Mayda (2010) and Grogger and Hanson (2011) show that by not controlling for unobserved migration costs in the scale regression, the impact of earning on migration is underestimated. The lack of fixed effects may thus explain the unstable relationship between income and migration in the literature.

[12] Alternatively, we can consider that this exogenous rate of unemployment is specific to

where N_{sh} is the population share born in s that migrates to h and N_{ss} is the population share born in s that remains in s. The probability of migrating will then depend on three main parameters: the difference of wages, the difference of employment protection and the migration cost. Differences of wages should influence migration positively ($\alpha > 0$). The migration cost may influence the probability of migrating negatively. And the effect of employment protection is undefined, depending on the sign of parameter $(\alpha\lambda^j - \chi\gamma^j)$. Here , the variables measuring the migration cost will be the same for different skills, whereas the effect of each variable may differ based on the skill of the migrant. This equation will be used to estimate the *scale* of migration.

3. Data, Empirical Specification and Econometric Strategy

3.1. Empirical Specification

As previously mentioned, the initial model is the following:

$$\ln \frac{N^j_{sh}}{N^j_{ss}} = \alpha[(wo_h - wo_s) + (\delta^j_h - \delta^j_s)] - \beta C^j_{sh} + (\alpha\lambda^j - \chi\gamma^j)(P_h - P_s) + (A_h - A_s) \tag{6}$$

However, N_{ss} is the *native* population of country s *living* in country s. This variable could be defined as the total population living in the country minus the total number of immigrants (defined as the population born abroad). The problem is that, for most developing countries, we only know the number of emigrants , but not the number of *immigrants*. N_{ss} is therefore unobserved. Following Beine et al. (2011), we transform our initial model as follows:

$$\ln N^j_{sh} = \alpha[(wo_h - wo_s) + (\delta^j_h - \delta^j_s)] - \beta C^j_{sh} + (\alpha\lambda^j - \chi\gamma^j)(P_h - P_s) + A_h + A_s \tag{7}$$

In this specification, N_{ss} is captured by origin fixed effects (A_s). The dependent variable is therefore the migration flows between source country s and

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each country, i.e. have δ_h instead of δ. If $\delta_h \neq \delta_s$, we have:

$$\ln \frac{N^j_{sh}}{N^j_{ss}} = \alpha[(wo_h - wo_s) + (\delta^j_h - \delta^j_s)] - \beta(f_{sh} + g^j_{sh}) + (\alpha\lambda^j - \chi\gamma^j)(P_h - P_s) - \chi(\delta_h - \delta_s) + (A_h - A_s) \tag{4}$$

However, it is very difficult to assess the difference of unemployment for a large number of countries empirically. The comparability of unemployment data is low. And in most developing countries, informal work is a substitute for unemployment. The official level of unemployment thus does not describe the real level of under-employment. The alternative would be to consider only the unemployment level in destination countries which are mainly OECD countries where unemployment data are homogenized. However, if unemployment data are not available or not relevant in source countries, the unemployment level in destination countries would be empirically captured by fixed effect A_h.

host country d. The subscript j refers to the level of education (high-skilled or low-skilled).

3.2. Data

Migration flow data[13] are from the International Migration Statistics (IMS) database (OECD, 2010). These data are provided by the Continuous Reporting System on Migration (SOPEMI) which encompasses most OECD countries, Baltic States and Bulgaria and Romania as host immigration countries. This data set provides migrant flows (inflows and outflows) and is based either on population registers, residence permit data or in a few cases on specific surveys. In this paper, we focus on the determinants of *inflows*, i.e. the migration from 76 possible countries of origin to 27 countries of destination (see the country sample in annex).[14] We keep the data from 2000 onwards, to avoid a problem of reverse causality with employment protection (the EPL index is built for that year).

Concerning the migration by skill level, we use the database built by Docquier and Marfouk (2004) which provides bilateral migration stocks of skilled and unskilled workers for 192 source countries , migrating to 30 OECD destination countries[15] for the years 1990 and 2000. This database covers 92.7 percent of the OECD immigration stock. We use the difference in stock between 2000 and 1990 to approximate the flow of migration, as in Beine et al. (2011).[16]

Employment protection is measured using the index of Botero et al. (2004), described in the previous section. The higher the index, the stronger the employment protection. More precisely, we use the employment protection differential, built as the difference between the level of employment protection in the country of destination and that of origin. Therefore, a small value for the employment protection differential reflects a relative "proximity" in labor market regulations, while a higher value captures a "social distance" between the two countries.

Concerning wage data, it is very difficult to find relevant data for a large sample of countries including many developing countries. Different databases exist (like the Luxembourg Income Study or the ILO wage database). However the number of countries is too limited for our sample, especially for developing

[13] See Annex A for a detailed description of the variables and the sources and Annex B for a correlation matrix and descriptive statistics of all variables.

[14] The migration database includes 154 countries of origin and 30 countries of destination. However, we are limited by the coverage of the Botero et al. (2004) index which covers 85 countries.

[15] As for the previous database, we are restricted by the use of the employment protection index. Our sample also includes 74 countries of origin and 27 countries of destination .

[16] As noticed by Beine et al. (2011), the proxy is not perfect as it is affected by deaths and return migration in 1990 , but *"it is accurate enough to derive a reasonable approximation"*.

countries[17]. We then use the GDP per capita as a proxy of individual income. It is nevertheless impossible to distinguish a wage for skilled and unskilled workers within the same country.

In order to do so, we use a methodology proposed by Grogger and Hanson (2011) for the estimations by skill level. They reconstruct an estimate of income for the 20th and 80th percentiles in the country by using the GDP per capita and GINI coefficient. The GDP per capita for the 20th percentile will then be considered as a proxy for the unskilled wage , while the GDP per capita for the 80th percentile will be considered as a proxy for the skilled wage. If we assume that income has a log-normal distribution, GINI coefficients can be used to estimate the variance of log income (see Annex C for details on how this is calculated). The GDP per capita is taken from the World Development Indicators database , while GINI coefficients come from WIDER.

We also control for the relative level of the informal sector. According to the insider/outsider theories, employment protection may push some workers out of the formal labor market. In this case, these new "outsiders" can be unemployed or work in the informal economy where employment protection legislation is not applied. If this is the case, we should observe a strong positive correlation between the size of informality, unemployment and the level of employment protection that may bias our results. However, in most developing countries, the unemployment rate is not really relevant because of the lack of unemployment benefits: workers have no other choice than to find an informal job. This is why we propose to add the differential of informality instead of the differential of unemployment rate. As a proxy, we use the level of informality measured by Schneider et al. (2010).

In both cases, the stock of immigrants in 1990 (Docquier and Marfouk, 2004) is used as an explanatory variable to approximate the size of the diaspora[18] As shown in Beine et al. (2011), the diaspora effect plays a key role in explaining migration flows, and can also be included in the cost function of migration. The diaspora tends to reduce this cost.

The cost of migration is also approximated by several bilateral variables: (1) sharing a border (*contiguity*), (2) sharing a language (*commonlanguage*), (3) having a former colonial relationship (*colony*), and the distance in kilometers between the two countries[19]. The cost of migration should be lower for countries which are culturally and historically close, whereas a greater geographical

[17]The alternative would be to use only wage data for destination countries , which are mainly developed countries where this information is available. However, as we include origin and destination fixed effects in our estimates, this variable will be dropped in the estimation.

[18]The diaspora level (expressed in millions) is divided by 10,000 in order to get comparable estimated coefficients.

[19]For all these variables, see Mayer and Signago (2006) for details. As for the diaspora variable, we divided the distance by 10,000 in order to estimate coefficients with a comparable magnitude

distance should increase the cost of migration. We also add a bilateral variable which takes the value of 1 if the two countries are in the Schengen free mobility area.

As explained previously, all other country characteristics specific to the country of origin or of destination will be captured by the inclusion of fixed effects (A_s and A_d) in our estimations.

3.3. Econometric Strategy

All estimations firstly use robust OLS estimators , and standard errors are clustered at the origin-destination-couple level. However, we should take different econometric problems into account: (1) the potential selection bias due to the high occurrence of zeros or missing values for the dependent variable, and (2) a possible endogeneity bias. We will briefly discuss these potential problems and propose methodologies to correct them.

3.3.1. Zero Flows and Missing Values

One important feature in our migration database is the potential selection bias either due to the high presence of missing observations (42% in our sample based on flows), or to the high presence of zero flows (20% of our sample based on stocks), or both.

In the IMS flows database, the proportion of zeros is relatively low (3.17% in 2000) , but the proportion of missing values is relatively high (42% in 2000). As noticed by Mayda (2010), *"the sum by country of origin of the IMS numbers is not equal to 100% of the total flow into each destination country.*" In Belgium, for instance, the immigrant inflow covered by the disaggregate data represents only 45% of total flows. Then, these missing values may represent small flows , particularly for small countries where migration is low. Not considering the missing observations in our analysis could lead to a bias of selection.

We then decide to keep these observations and to estimate our model using a Pseudo-Poisson Maximum Likelihood (PPML). This method is consistent when there is a high proportion of zeros and problems of heteroskedasticity (Silva and Tenreyro, 2006).[20]

[20] As a robustness check, we also estimate a Heckman two-step selection model as in Beine et al. (2011). We use the diplomatic exchange as an exclusion variable. The results remain mostly similar to our results and can be obtained upon request. The main problem of this strategy is the sensitivity of the parameter estimates to different exclusion variables (Greene 2005, p.789). Also, the PPML method is more accurate to deal with problems of heteroskedasticity. Silva and Tenreyro (2006) show that it is more likely to be a problem when estimating gravity equations. This is why we prefer using the PPML method.

3.4. Endogeneity Bias

Endogeneity may be an issue if (1) there are omitted variables that are correlated with our variable of interest, and if (2) there is a reverse causality in the event that migration affects employment protection.

In our case, the inclusion of fixed effects in the country of origin and of destination reduces the potential bias of the omitted variable. One possible omitted variable could be immigration policy, which may be linked to the stringency of labor market regulations. The interaction between a restrictive migration policy and the generosity of the welfare state (through its social or fiscal policies) has been widely studied (Auerbach and Oreopoulos, 1999; Lee and Miller, 2000; Storesletten, 2000; Razin et al., 2009). Here, there are two differences. First, we focus on labor market institutions and not on social expenditures as it is done in the literature on welfare migration. Second, migration policy is mainly unilateral. Bilateral agreements are very limited (except for the Schengen area, which we control for) , or do not change the scale of the unilateral migration policy of the host country. As we estimate the impact of the employment protection *differential*, we can include origin and destination fixed effects. Following Beine et al. (2011), the effect of migration policy is therefore captured by destination fixed effects. This choice is made also taking into account the lack of consensus in the literature on the appropriate way of measuring such migration policies. Indeed, another possible omitted variable is the generosity of the welfare state. We acknowledge that social expenditures in *destination* countries may be a significant determinant of migration. However, the effects of social characteristics in destination countries are captured through destination fixed effects. Contrary to employment protection, the *differential* of social expenditures between the country of origin and of destination is of little interest. What may matter for the migrants is the level of social services provided by the State, and not the general level of social expenditures *per se*. As these expenditures are very heterogeneous from one country to another, the level of social services provided by $1 of social expenditures cannot really be compared internationally.

The other potential econometric problem is reverse causality. In our case, it could mean that bilateral migration flows have an impact on employment protection legislation. By using migration flow data after 2000, we exclude this possibility. Also, we use a bilateral database. The probability that migration from one specific country to another affects the legislation is therefore limited, at least in the short run.

Even if we show that this endogeneity bias is more likely to be very limited in our case, we cannot completely exclude this possibility because of the inherent risk of remaining omitted variables that may be correlated with the level of employment protection. We therefore propose to use a two-stage least-square (2SLS) method with instrumental variables to check the consistency of our results. Such instrumental variables should be exogenous and not correlated with the error term (the condition of orthogonality). In other words, these variables

should be correlated with employment protection (the condition of relevance) , but should not have any direct impact on migration. We use the literature on the determinants of employment protection to find such instruments. One potential candidate is the legal system of a country (common law versus civil law). However, it appears that migration can also be explained by historic legal systems (Cohen et al., 2009). It cannot be considered as a valid instrument.

Botero et al. (2004) consider that labor regulation can be seen as a result of a game between employers and employees, depending on their relative bargaining power. Stringent employment protection is more likely to be adopted where the bargaining power of workers is strong. This linkage is common in the literature on labor market institutions. Saint-Paul (2002) for instance shows the complementarity between employment protection and other labor market policies which are essentially explained by the bargaining power of workers. The political power of unions is thus a strong determinant of employment protection. Saint-Paul (1996) shows that a lot of labor market reforms failed due to a broad mobilization of "insiders", represented by some trade unions. One crucial aspect is not only the bargaining power of workers within firms , but the ability of unions to influence governmental decisions.

This is why we propose to use the indexes proposed by Botero et al. (2004) to measure the legal protection of workers. More specifically, we propose to use the right to unionize and to strike as instrument variables. The first instrument is therefore a political strike dummy variable, defined as the legal right to go on strike because of governmental decisions. The second instrument captures whether the law allows to go on strike to express solidarity with another union or worker , even if there is no grievance against one's own employer. Third, the additional instrument we propose to use is the protection of the right to form a trade union. This variable is equal to one if this right is expressly granted by the constitution and zero otherwise. In our view, the right to unionize and the right to strike could indicate a stronger political power of unions , and could affect governmental decisions in particular concerning labor market institutions and employment protection laws. It is however very difficult to see how these variables could be correlated with the probability of migrating. This is why we consider these variables are possible valid and relevant instruments. Our endogenous variable is the employment protection differential , so we also use the differential of our variables between the country of destination and of origin as an instrument. Because our instruments are dummy variables, the differential can be either equal to -1 or 0 or 1.

Obviously, the collinearity between instrumental variables and some country fixed effects is very strong and leads to estimations that could be biased. So, we have decided to use 2SLS estimations without country fixed effects. The possibility of an omitted variable bias is limited by the use of instrumental variables. We also add an additional list of control variables, reflecting the country characteristics that are considered to be the main determinants of international

migration (Hatton and Williamson, 2006, 2008).[21]

We report two tests showing the relevance and validity of our set of instruments. The F-statistic of the first stage checks the relevance of our instruments, i.e. the capacity to explain our endogenous variable (here, employment protection). We generally consider that an F-statistic higher than 10 is an acceptable condition of relevance. The Hansen over-identification test aims at checking the condition of orthogonality. To consider our set of instruments valid, we should reject the null hypothesis. We report the p-value associated with this test.[22]

4. Empirical Results

First, we will present the results estimating the determinants of migration flows using the IMS data set. Then, we will present the results concerning the migration of low-skilled and high-skilled workers using the Docquier and Marfouk (2004) data set.

4.1. Influence of the Employment Protection Differential on Migration Inflows

[TABLE 2 ABOUT HERE]

The main results concerning the estimates of the scale of migration (equation 7) are given by Table 2. The first column reports OLS robust estimators with standard errors clustered at the origin-destination-couple level. The second column presents the Pseudo-Poisson Maximum Likelihood (PPML) regression model, and the last column, the results using the Two-Stage Least-Square (2SLS) method.

We show that the differential of employment protection is a strong determinant of migration. We find that the higher this differential, the lower the migration flow. The estimated coefficient is negative and strongly significant (at the 1% significance level). A large gap between employment protection in the source and the destination country may be seen as a "social distance" that will increase the migration cost. Based on the model, three interpretations can be made: (1) the effect of labor protection on wages is negative, inducing a

[21] The control variables are the following: the population in the country of origin and of destination, the percentage of people between 15 and 24 years old in the countries of origin (WPP 2008), the percentage of secondary school attained (Barro and Lee, 2000), the index of democracy (POLITY IV), immigration policy measured as the government's view , and the share of refugees in the total number of migrants (United Nations, 2002; Beine et al., 2011). See the Annex for a detailed description of these variables .

[22] We use secondary strikes and unionization as instrumental variables for the estimates with the IMS data. We use political strikes and unionization for the estimates with the Docquier and Marfouk (2004) data (see the definition of instruments in Annex A). We chose this to ensure the respect of both the condition of orthogonality and the condition of relevance.

negative parameter λ_h^j, (2) the effect of labor protection on the risk of unemployment is more negative than the effect on the wage ($|\gamma^j| > |\lambda^j|$ with $\lambda^j < 0$), or (3) $\chi > \alpha$ which may be interpreted as a preference for job security over wage premium. Migrants do not seem to look for more protective labor legislations if they lead to a too great "social distance" between their country of origin and the country of destination, as it may negatively affect their capacity to integrate the labor market.

The estimated coefficients are relatively similar when using PPML and OLS (-3.264 in OLS against -3.520 in PPML). The third estimate using the TSLS method confirms the consistency of this result. The magnitude of the coefficient is however lower when controlling for endogeneity , but remains negative and strongly significant. Overall, the estimated coefficient is included between -1.1 and -3.5. To give a quantitative assessment of this result, let us take the case of the migration from Egypt to France. The EPL index takes the value of 0.37 for Egypt and 0.74 for France. If we want to observe the effect of a one standard deviation fall in the employment protection differential, it can come from an increase in employment protection in Egypt or a decrease in employment protection in France. The standard deviation of the employment protection differential is 0.27. This theoretical situation may approximatively reflect the fact that Egypt has increased its level of employment protection, closer to a level like that of Poland, Mali or Panama. Another possibility is that this change comes from a decrease in employment protection in France, which could indicate that the average level in this country has become closer to that of Austria or South Korea. This *decrease* in the employment protection differential will therefore be associated with an *increase* in migration flows, estimated between 26% and 63% depending on the method of estimation.[23]

The differential of the informal labor market size is positively and significantly associated with the level of migration flows. As this differential is negative on average (informality is lower in destination countries than in countries of origin), it means that migrants are attracted by countries with a level of informality close to that of their country of origin. It can be interpreted as a proxy of the capacity for migrants to integrate the labor market of their destination country. The differential of GDP also takes the expected sign. However, we should note that these effects are no longer significant when using the PPML method.

As found in Beine et al. (2011), the lagged diaspora explains the international migration inflows positively and significantly. This means that the size of the diaspora should decrease the cost of migration and therefore reinforce the scale

[23]The calculations are based on the following formula: $(e^{\beta \cdot \sigma} - 1) * 100$. There were 758 migrants from Egypt to France on a yearly basis. It could mean that a one standard deviation fall in the employment protection differential can explain an increase in the number of migrants, for a total included between 955 and 1,213 depending on the method of estimation.

of migration.

Geographical and cultural proximity plays a key role in the migration process. Distance is found to have a negative impact on migration , while sharing a border, a language and a colonial history has a positive impact on migration.

4.2. Influence of the Employment Protection Differential on Migration Selection

After explaining the scale of migration, we want to see if these effects can be distinguished between low-skilled and high-skilled migrants. Table 3 presents our results. The determinants of high-skilled migration are presented in columns 1-3 and those of low-skilled migration in columns 4-6. For each skill level, the same structure is adopted with OLS (Columns 1 and 4), PPML (Columns 2 and 5) and then 2SLS estimations (Columns 3 and 6). We should take into account the fact that we had to use another migration database for this set of estimations. Thus, the magnitude of the coefficients cannot be compared directly with the previous one. Also, contrary to the previous set of estimates, flows are approximated by the difference of stocks between 1990 and 2000. The time span is therefore slightly different and we cannot control for return migration. The results should therefore be interpreted cautiously.

[TABLE 3 ABOUT HERE]

We find a strong difference of impact between high-skilled and low-skilled migrants. For the former, we still find a negative and strongly significant coefficient, confirming our previous results. The results are much more striking for low-skilled migrants. We even find a positive impact of the employment protection differential on migration when using the OLS and PPML methods. One should however be very cautious in the interpretation of this last result. We find a negative and significant coefficient when using the TSLS method, even if the magnitude of the coefficient is much lower than for high-skilled workers. The possible influence of other social characteristics, correlated with the level of EPL may explain the difference of results between the TSLS, PPML and OLS methods.

What can be learnt from this last set of estimates? First, the negative impact of employment protection is no longer robust for low-skilled workers. Second, whatever the method of estimation chosen, we find a much stronger effect for high-skilled workers. This result supports the one presented by Cohen et al. (2009) for social protection.

The results for the differential of GDP or informality are much less robust. The negative sign for the GDP per capita can be explained by the existence of a fixed cost of migration which cannot be paid if the differential of income is too high. The level of informality also seems to be very different for low-skilled

and high-skilled workers. Further investigation, which goes beyond the scope of this paper, would be needed to fully explain such a result.

Concerning the diaspora, our result supports the finding of Beine et al. (2011) that showed a stronger effect for low-skilled migrants than for high-skilled ones.

Geographical and cultural factors also have a distinct impact depending on the skill level. For high-skilled workers, we found that a common language was the most important factor, while low-skilled migration is more impacted by colonial history and distance. The Schengen agreement also seems to have more impact on high-skilled migration.

5. Conclusions

In this paper, we have shown how employment protection may affect a migrant's decision. We have considered two possible transmission channels, exhibited by the literature, the first through the wage level and the second through the probability of being employed.

The main result is that migrants are not looking for more protective labor legislation. The employment protection differential acts as a repellent for migrants. We have found that this negative effect is stronger for high-skilled workers. The key aspect related to the labor market which explains the destination choice of migrants is their capacity to integrate the labor market in their destination country. If the "social distance" is too high, their position on the labor market is more likely to be an outsider position and their probability of getting a job is lower. This is why they may choose countries where labor market regulations are not too far from those in their country of origin.

By looking at migration flows, we are able to focus on the specific situation of newcomers on the labor market of their destination country. As they are more likely to be outsiders in these markets, we can test the hypothesis that migrants, whose goal is to maximize their job finding probability, are less likely to migrate to countries with a more protected labor market. Our estimations confirm this assumption.

One important question which is left for future research is the influence of employment protection on return migration. It would be interesting to see how immigrants who have managed to integrate the local labor market react to employment protection. In other words, employment protection may also be a factor retaining immigrants in a given country. We have made exploratory estimates to estimate the influence of employment protection on migration outflows, using the same OECD data, and have found a negative correlation. We do not

present the results of these estimates here due to problems with the data[24], but this suggests that it is an important issue for researchers.

The main implication of our paper is the link between *immigration policies* and *employment protection*. If the goal of immigration policies is to attract relatively more educated workers, a stricter employment protection on the labor market in itself does not seem to be the right tool. Employment protection should be compensated for by more open immigration policies. This linkage can also be seen differently. Migrants are often said to be looking for protective legislation and generous welfare systems. Here, employment protection tends to act as a repellent more than as an attractive force.

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[24]The OECD recognizes that outflows are less well reported than arrivals, especially when using population registers. When using statistics on permits, some migrants are excluded if they do not need a permit to exit the country. Also , this outflow database does not measure *per se* the level of return migration , but the outflows by nationality. We do not know if migrants return or move to another country.

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Appendix

A. Source and Description of the Variables

[TABLE 4 ABOUT HERE]

B. Correlation Matrix

[TABLE 5 ABOUT HERE]

C. Wage Data

We use the GDP per capita from WDI and the Gini coefficient from WIDER. This methodology is proposed by Grogger and Hanson (2011) to reconstruct estimates of high-skilled workers' and low-skilled workers' wages. The first step is to transform the Gini coefficient into the standard deviation of log income. If income X is lognormally distributed, we have: $\ln X \sim N(\mu, \sigma^2)$.

If G is the Gini coefficient, we have $\sigma = \sqrt{2}\phi^{-1}(\frac{G+1}{2})$, where ϕ^{-1} is the inverse of the standard normal cumulative distribution function (Bendel et al., 1989).

Quantiles of income x_α such that $P(X < x_\alpha) = \alpha$ are given by:

$$x_\alpha = \exp(\mu + z_\alpha \sigma) \tag{8}$$

z_α is the α quantile of a unit normal random variable Johnson and Kotz (1970). Since under lognormality, $E(X) = \exp(\mu + \sigma^2/2)$ we can rewrite the previous equation as follows:

$$x_\alpha = E(X)\exp(\sigma z_\alpha - \sigma^2/2) \tag{9}$$

We use the GDP per capita to estimate $E(X)$ and the Gini coefficient to estimate σ according to the previous formula.

D. Summary of Statistics

[TABLE 6 ABOUT HERE]

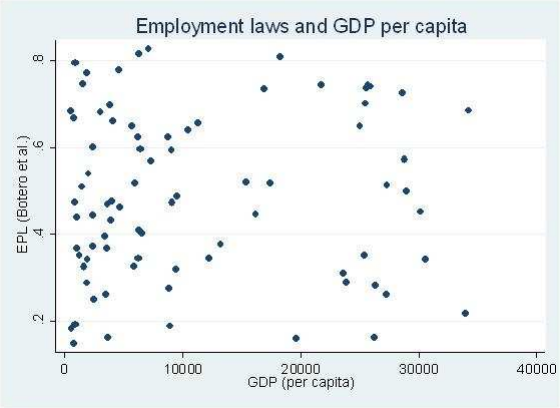
E. Countries of Origin

Argentina Armenia Australia Austria Belgium Bolivia Brazil Bulgaria Burkina Faso Canada Chile China Colombia Croatia Denmark Dominican Republic Ecuador Egypt Finland France Georgia Germany Ghana Greece Hungary India Indonesia Ireland Israel Italy Jamaica Japan Jordan Kenya Korea, Rep. Lithuania Madagascar Malawi Malaysia Mali Mexico Mongolia Morocco Mozambique Netherlands New Zealand Nigeria Norway Pakistan Panama Peru Philippines Poland Portugal Romania Russian Federation Senegal Singapore Slovak Republic South Africa Spain Sri Lanka Sweden Switzerland Tanzania Thailand Tunisia Turkey Uganda Ukraine United Kingdom Uruguay Venezuela, RB Vietnam Zambia Zimbabwe

F. Destination Countries

Australia Austria Belgium Canada Denmark Finland France Germany Greece Hungary Ireland Italy Japan Korea, Rep. Mexico Netherlands New Zealand Norway Poland Portugal Slovak Republic Spain Sweden Switzerland Turkey United Kingdom United States

Figure 1: EPL and GDP per capita



EPL (Botero et al. 2004), GDP per capita (World Development Indicators)

Table 1: EPL by region and income

Region	Numb. countries	Mean	St. Er.	Min	Max
Asia & Pacific	15	0.38	0.14	0.16	0.68
Europe & Central Asia	32	0.61	0.15	0.28	0.83
Latin America & Caribbean	13	0.45	0.15	0.16	0.65
Middle East & North Africa	5	0.49	0.25	0.26	0.82
North America	2	0.24	0.03	0.22	0.26
Sub-Saharan Africa	14	0.41	0.20	0.15	0.80
Income	**Numb. countries**	**Mean**	**St. Er.**	**Min**	**Max**
High income: OECD	28	0.52	0.20	0.16	0.81
High income: Non-OECD	2	0.40	0.12	0.31	0.49
Upper middle income	24	0.49	0.19	0.16	0.83
Lower middle income	17	0.44	0.18	0.15	0.77
Low income	10	0.50	0.21	0.18	0.79

Source: Botero et al. 2004

Table 2: Determinants of Migration Inflows on Average Between 2000 and 2008

	OLS Average Inflows 2000-2008	PPML Average Inflows 2000-2008	2SLS Average Inflows 2000-2008
EPL (differential)	-3.264***	-3.520***	-1.092***
	(0.611)	(0.822)	(0.419)
Informality (differential)	0.0561***	-0.118	0.0266***
	(0.00805)	(0.121)	(0.00619)
GDP (differential)	0.0376***	-0.0660	0.0785***
	(0.0106)	(0.0954)	(0.00869)
diaspora 1990	0.00995***	0.0118***	0.0210***
	(0.00282)	(0.00186)	(0.00591)
contiguity	0.436**	0.705***	0.162
	(0.214)	(0.206)	(0.287)
common language	1.346***	1.221***	1.038***
	(0.134)	(0.165)	(0.176)
colony	1.171***	0.543***	1.696***
	(0.192)	(0.171)	(0.257)
distance	-1.551***	-1.423***	-1.139***
	(0.155)	(0.208)	(0.130)
Schengen	-0.0235	-0.162	0.412**
	(0.143)	(0.206)	(0.193)
Constant	6.548***	3.536	6.416***
	(0.301)	(3.073)	(0.593)
Origin fixed effects	YES	YES	NO
Destination fixed effects	YES	YES	NO
Control variables	NO	NO	YES
Observations	1487	1900	1091
R-squared	0.810	0.756	0.451
F test			151.1***
Hansen Test			0.4422

Robust t-statistics in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
In Column 3, the endogenous variable is EPL(differential) and the instruments are the differential of secondary strikes and unionization (see the definition of the variables in Annex A). Control variables: population in countries of origin and destination, percentage of people between 15-24 years old in countries of origin (WPP 2008), percentage of secondary school attained (Barro and Lee, 2000), index of democracy (POLITY IV), immigration policy and share of refugees in total number of migrants (United Nations, 2002; Beine et al., 2011)

Table 3: Determinants of Migration by Educational Level: High- vs Low-Skilled Migrants

	High OLS	High PPML	High 2SLS	Low OLS	Low PPML	Low 2SLS
EPL (diffential)	-2.340***	-5.970***	-3.029***	4.239**	4.474*	-1.827***
	(0.545)	(1.601)	(0.463)	(1.643)	(2.508)	(0.629)
Informality (differential)	0.0400***	-0.746*	0.0167***	-0.0181	-2.093***	0.00508
	(0.00739)	(0.422)	(0.00638)	(0.0176)	(0.625)	(0.00775)
GDP 80% (differential)	-0.0413***	-0.388	0.0499***			
	(0.00939)	(0.249)	(0.00734)			
GDP 20% (differential)				-0.145***	-4.229***	0.0224
				(0.0342)	(1.300)	(0.0244)
diaspora 1990	0.0118***	0.0156***	0.0267***	0.0283***	0.0245***	0.0331***
	(0.00367)	(0.00479)	(0.00893)	(0.00539)	(0.00547)	(0.0118)
contiguity	0.697***	0.516	0.00915	1.226***	1.791***	0.536
	(0.262)	(0.314)	(0.382)	(0.371)	(0.386)	(0.633)
common language	1.284***	1.141***	2.031***	0.759***	0.845***	0.385
	(0.132)	(0.172)	(0.179)	(0.214)	(0.315)	(0.284)
colony	1.093***	0.482**	1.298***	1.920***	0.774	2.514***
	(0.243)	(0.230)	(0.276)	(0.469)	(0.505)	(0.652)
distance	-1.297***	-0.658**	-0.734***	-1.390***	-1.741***	-1.253***
	(0.126)	(0.266)	(0.150)	(0.233)	(0.400)	(0.221)
Schengen	0.679***	0.947***	-0.124	-0.0613	0.192	-0.628
	(0.184)	(0.287)	(0.248)	(0.357)	(0.808)	(0.388)
Constant	6.791***	10.41***	4.844***	5.047***	-45.26***	4.302***
	(0.403)	(0.534)	(0.692)	(0.492)	(14.64)	(0.948)
Origin fixed effects	YES	YES	NO	YES	YES	NO
Destination fixed effects	YES	YES	NO	YES	YES	NO
Control Variables	NO	NO	YES	NO	NO	YES
Observations	1314	1601	977	917	1239	644
R-squared	0.814	0.911	0.440	0.719	0.987	0.342
F-test			170.31***			114.88***
Hansen Test			0.5828			0.2894

Robust t-statistics in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
In columns 3 and 6, the endogenous variable is EPL (differential). The instruments are the differential of political strike and unionization (see the definition of the variables in Annex A). Control variables: population in countries of origin and destination, percentage of people between 15-24 years old in countries of origin (WPP 2008), percentage of secondary school attained (Barro and Lee, 2000), index of democracy (POLITY IV), immigration policy and share of refugees in total number of migrants (United Nations, 2002; Beine et al., 2011)

Table 4: Description of variables

Variable	Description	Source
Dependent variables		
Average Inflows 2000-2008	Average inflows of migration over the 9 years (2000-2008) in log	OECD (2010)
High skilled migration	Difference in high-skilled migration stock between 2000 and 1990 (in log)	Docquier and Marfouk (2004)
Low skilled migration	Difference in low-skilled migration stock between 2000 and 1990 (in log)	Docquier and Marfouk (2004)
Explanatory variables		
EPL (differential)	Differential of measures of the protection of labour and employment laws between source and destination countries as the average of: (1) Alternative employment contracts; (2) Cost of increasing hours worked; (3) Cost of firing workers; and (4) Dismissal procedures.	Botero et al. (2004)
Informality (differential)	Differential of size of the shadow economy as a percentage of GDP. between source and destination countries	Schneider et al. (2010)
GDP (differential)	Differential of GDP per-capita in PPP divided by 1000 between source and destination countries	World Development Indicators 2006
Gini	GINI	WIDER
GDP 20% (diff.)	Differential of wage for low-skilled divided by 1000 between source and destination countries	Authors computations
GDP 80% (diff.)	Differential of wage for high skilled divided by 1000 between source and destination countries	Authors computations
Diaspora 1990	Bilateral migration stock in 1990 divided by 10000	Docquier and Marfouk (2004)
Contiguity	dummy equal to 1 if common border	CEPII
Common language	dummy equal to 1 if same language	CEPII
Colony	dummy equal to 1 if former colonial link	CEPII
Distance	simple distance (most populated cities, in km) divided by 10000	CEPII
Schengen	1 if Shengen agreement	European Commmission
Control variables		
Pop	Population divided by 100000000 for origin and destination countries	World Development Indicators 2006
Pop15-24	Percentage of 15-24 years old in the total population for origin countries	World Population Prospect 2008 rev.
Education	Percentage of "secondary school attained" in the total population for origin countries	Barro and Lee (1996, 2000)
Polity	Agregate index of democracy for origin countries	Polity IV project
Immigration policy	1 if the goal of the hosting gouvernment is to lower migration 0 if the goal is to maintain or no intervention	United Nations (2002)
Asylee share	Share of refugees in the total number of migrants in 2000 in destination countries	Beine et al. (2011)
Instruments		
Political strike	Differential of possibility to be in strike for political reason between source and destination countries	Botero et al. (2004)
Secondary strike	Differential of possibility to be in strike for solidarity between unions or worker between source and destination countries	Botero et al. (2004)
Unionization	Differential of possibility to unionize between source and destination countries	Botero et al. (2004)

Table 5: Cross-correlation table

Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. ln(Inflows Mig)	1.000													
2. ln(High Mig)	0.846	1.000												
	(0.000)													
3. ln(Low Mig)	0.798	0.832	1.000											
	(0.000)	(0.000)												
4. diaspora 1990	0.264	0.301	0.248	1.000										
	(0.000)	(0.000)	(0.000)											
5. EPL (diff.)	-0.124	-0.175	-0.099	-0.099	1.000									
	(0.000)	(0.000)	(0.001)	(0.000)										
6. Informality (diff.)	0.148	0.095	0.091	0.019	0.099	1.000								
	(0.000)	(0.000)	(0.003)	(0.398)	(0.000)									
7. GDP (diff.)	-0.114	-0.068	-0.062	-0.027	-0.001	-0.692	1.000							
	(0.000)	(0.000)	(0.004)	(0.077)	(0.972)	(0.000)								
8. GDP 80% (diff.)	-0.123	-0.051	-0.058	-0.023	-0.035	-0.696	0.999	1.000						
	(0.000)	(0.021)	(0.024)	(0.219)	(0.138)	(0.000)	(0.000)							
9. GDP 20% (diff.)	-0.196	-0.199	-0.202	-0.049	0.020	-0.655	0.965	0.953	1.000					
	(0.000)	(0.000)	(0.000)	(0.008)	(0.391)	(0.000)	(0.000)	(0.000)						
10. contiguity	0.195	0.204	0.225	0.198	-0.042	0.103	-0.142	-0.144	-0.143	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.055)	(0.000)	(0.000)	(0.000)	(0.000)					
11. language	0.166	0.266	0.163	0.102	-0.054	-0.072	0.099	0.094	0.052	0.111	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)	(0.014)	(0.001)	(0.000)	(0.000)	(0.003)	(0.000)				
12. colony	0.229	0.234	0.219	0.154	0.003	-0.005	-0.018	-0.015	-0.029	0.122	0.324	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.890)	(0.806)	(0.239)	(0.408)	(0.105)	(0.000)	(0.000)			
13. distance	-0.241	-0.139	-0.228	-0.048	-0.033	-0.145	0.104	0.078	0.085	-0.210	0.062	-0.046	1.000	
	(0.000)	(0.000)	(0.000)	(0.002)	(0.141)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)		
14. schengen	0.144	0.127	0.101	0.050	-0.043	0.224	-0.236	-0.200	-0.199	0.196	-0.020	-0.018	-0.243	1.000
	(0.000)	(0.000)	(0.000)	(0.001)	(0.051)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.178)	(0.222)	(0.000)	

ln(Inflows Mig) is the logarithm of average inflows of migration in OECD countries between 2008 and 2000
ln(High Mig) is the logarithm of the difference of migration stock for high skilled people between 2000 and 1990
ln(Low Mig) is the logarithm of the difference of migration stock for low skilled people between 2000 and 1990

Table 6: Summary statistics

Variable	Mean	Std. Dev.	N
ln(Inflows Mig)	4.404	2.732	3029
ln(High Mig)	4.917	2.567	2824
ln(Low Mig)	4.269	2.604	2164
EPL (differential)	0.041	0.271	2052
Informality (differential)	-12.725	16.316	2052
GDP (differential)	15.342	13.798	4470
GDP 80% (differential)	20.692	19.685	3159
GDP 20% (differential)	8.202	7.845	3159
diaspora 1990	0.833	6.21	4312
contiguity	0.02	0.14	4620
common language	0.096	0.295	4620
colony	0.033	0.178	4620
distance	0.699	0.431	4620
schengen	0.039	0.193	4620

ln(Inflows Mig) is the logarithm of average inflows of migration in OECD countries between 2008 and 2000
ln(High Mig) is the logarithm of the difference of migration stock for high skilled people between 2000 and 1990
ln(Low Mig) is the logarithm of the difference of migration stock for low skilled people between 2000 and 1990